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LECTURE

“How God Made the Soil Fertile”



By **ROBERT S. SEEDS**

BIRMINGHAM, PA.

1908

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R. S. SEEDS

BIRMINGHAM, PA.

“HOW GOD MADE THE SOIL FERTILE”



The Seeds house, One-hundred Springs Farm, Birmingham, Pa.

Restoration of the Soil by Addition of Vegetable Matter

AT Chautauquas last summer, and at Farmers' Institutes, many people came to me at the close of my lectures and asked if I had my soil talk in book form,—hence the writing of this book. My effort in writing this small book shall be to write it as I have been talking it, as nearly as possible.

Life is a funny proposition. Fifteen years ago, I sold out a good business in Tyrone City, Pa. (few better in the town), and went down to the adjoining county—Huntingdon—and bought an old worn-out, run-down and abandoned farm. Windows were nailed up, roofs letting in the rain, gates going without hinges, fences had disappeared, and there had not been a farmer on it for seven years, because they could not find a man who would farm it.

The land was so poor that you could not raise anything, not even a disturbance; could not raise an umbrella on it; sometimes I found difficulty in raising my voice on it. It was the most desolate-looking place in my county.

My friends said I was the biggest fool on earth, and that I ought to have a guardian appointed over me; and, the day we moved down on the farm, Mrs. Seeds cried.

I began to haul stable manure from Tyrone City, two and one-half miles away, and I did not get many acres covered until that lead pencil (we know what it costs, but you cannot tell what it is worth) told me it was costing me \$20 per acre to cover it. Could not stand that; so, as I lived in the greatest lime-stone region in the state, I thought I would lime it. But I did not get many acres covered until I found out it was costing me \$10 to \$15 per acre to lime it, and, as I did not have a huge bank account or a rich father-in-law to lean up against, I made up my mind I could not stand it; so, about that time I was burning midnight oil, studying the soil. There are two things I have loved well enough to sit up until twelve o'clock at night and burn midnight oil with,—the one was Mrs. Seeds and the other was that old farm,—and I do not begrudge the time I spent with either of them.

If I had not loved that old farm and sat up with it until twelve o'clock at night, I never would have seen the boys take \$60 per acre off it, or have sold the soil at \$1.50 per bushel.

I want to say right here, if any one reading this book has an occupation or position he does not like or love, he has my sympathy from the bottom of my heart. Oh, what a pleasure to do something or work at something we love! So, it was because I loved to do it that I burned midnight oil, studying the soil.

Take two young men; start them out in life. The one loves his business; the other does not. The one will burn midnight oil; the other will not. The one is a success; the other is a failure; and there is nothing down at the bottom of it but love. So, in burning this midnight oil, I found out that in the first foot of that old wornout farm there was enough of *plant food to last from one hundred to one thousand years; but it was locked up and the plants could not get it.* I also found out that three-fourths of the air was nitrogen, that was costing me at that time about fourteen cents per pound in the commercial fertilizer sack. When I found this out, I said to myself, "The Lord is unjust to have all this plant food under my feet and over my head, and have it locked up so that I cannot get it, nor the plants that I am trying to grow." But the longer I thought about it, the more I came to the conclusion that the Lord does not make many mistakes, and I would sooner have the Lord manage the weather in my community than any neighbor I have; for if the Lord did not lock up this plant food what would we do? We would use up every bit of it, haul down the very skies and use it, and starve the poor fellow to death who is coming after us. But the Lord says, "You shall not do it;" so he locks it up, and neither you, I, nor any other man can get it, and use it in any other way than nature's way, and the way I am about to describe in this little book.

Ages ago, this earth was solid rock. The rock began to disintegrate and the soil began to form. Vegetation began to grow, and that was the starting place in making soil fertile; and the more vegetation a section of the earth produced, the richer that portion became; hence the prairie was richer than the forests of the East, because the surface of the earth got more vegetation from the grasses than where the forests stood.

The Lord made all the acres of the land fertile from the Atlantic to the Pacific, and gave it to man to live upon, to prosper, and be happy. In doing so, he never hauled a wagon-load of manure or a load of lime, nor bought a ton of fertilizer,—and how did he do it?

He did it with vegetable matter; and I thought that if the Lord could do it, I could do it. This sounds a little conceity, but I mean it.

I have no use for a man who sits around whittling a store box, waiting for the Lord to turn something up for him; and the man who crops his land ignorantly until he gets it so he cannot raise anything on it, and expects to sit on his front porch and have the Almighty give him two hundred bushels of potatoes to the acre, will sit there a long time. If you do not believe it, try him once.

If the Lord could do it with vegetable matter, I could do it. I knew he created plants that have the power to pull the nitrogen out of the air and put it in little sacks on their roots, and other plants that have the power to pump up the potash and phosphoric acid from the subsoil.

The first plant I used was the crimson clover, and, when I began to use it, they all said it would not grow in Pennsylvania on the foot-hills of the Allegheny mountains, but that it was a plant for the South. But I sent to Michigan and New York state and got bulletins on the crimson clover, and found that they were not only raising the plant, but producing the seed; so, instead of going South for the seed, I sent to Michigan for it. I would sow it in my corn field in front of the cultivator the last time I worked the corn, and would scratch other fields with the spring-tooth harrow in the spring, when we had heat and moisture, and sow it there. The growth of vegetable matter I would get in my corn field I would plow down the next May or June, just before the vitality left the stock to mature the seed in the head when the sap began to get sticky, so I would not sour the ground, and put that field to wheat in the fall. Then I would take another field that was covered with sorrel and goldenrod, plow it and cultivate it; for I believed then, as I do now, that cultivation released and made available some of that great store of plant food that was locked up. I would put that field to oats with commercial fertilizer in the drill. Did not get much vegetable matter at first.

This was my rotation until I got my farm covered with grass; and I did not want to take a grass field for oats, but wanted my cornstalks for oats. When I wanted my cornstalk field for oats, and had to plow the field in the fall or early spring, the crimson clover plant did not seem to be what I wanted, as it did not produce as many tons of vegetable matter to the acre as I seemed to crave.

The next spring I sent to Clearfield county, Pa., bought some buckwheat, and got some purple-top strap-leaf turnip seed and crimson clover seed. When I worked my corn the last time that

season, I sowed in front of the cultivator the first strip in the field with the buckwheat, the next strip with purple-top strap-leaf turnip and crimson clover mixed, and the rest of the field with crimson clover.

The buckwheat did not seem to make much vegetable matter, and it seemed to disappear the first frost. We had better corn where we had the turnips and crimson clover mixed. It seemed to shade the ground and help hold the moisture. The ground under it was dark brown, and, in some places, moldy on the top.

I used to sell agricultural implements, and, in traveling through the country, I used to see good spots in oat fields. I was told that they were caused by pulling the turnips in the fall in the corn field, throwing them in piles, then cutting the tops off and letting them lie there, while the turnips were taken to the barn. The tops rotting and plowed down caused the good spots in oats,—hence my going for turnip seed.

We put the corn and fodder into the barn. The field was then plowed for oats, and you could see that belt through the middle of the oat field where turnips and crimson clover was, as far as you could see the field. The oats was cut, put in the barn, and the field plowed for wheat; and two weeks after the field was plowed and harrowed, you could see that belt through the middle of the plowed field as far as you could see the field. This was easy, if you stop to think. I said the oats was better there than at any other place in the field; hence it was riper there than elsewhere in the field, and, in cutting it with the binder, it shelled more than where it was greener; so, the belt that could be so plainly seen was caused by the growing of the young oats.

Still, I was not satisfied with the purple-top strap-leaf turnip, for it grew on top of the ground. I wanted a plant with a longer root,—one that would go down into the subsoil below the furrow after the potash and phosphoric acid. I took all the seed catalogues I had on that famous desk that is known over the country, and went through them to find a plant that I could produce in a short time, and that had a long root. I had to see the picture of it, for I could not tell by the name of it what it would be like.

When I was going through Shumway's (Rockford, Ill.) catalogue, I came across the picture of the cowhorn turnip, and I saw it had a long root, something like a cow's horn, and one that would go down into the subsoil below the plow.

That year I sent to Shumway and got cowhorn turnip seed; sent



STOCKMAN & FARMER, PITTSBURGH, PA.

Plowing down cowhorn turnips and crimson clover. One-hundred Springs Farm, November 21, 1899

to Michigan and got crimson clover seed; mixed them together, and sowed in the corn field in front of the cultivator the last time we worked the corn. This was the start of all the controversy about cowhorn turnip.

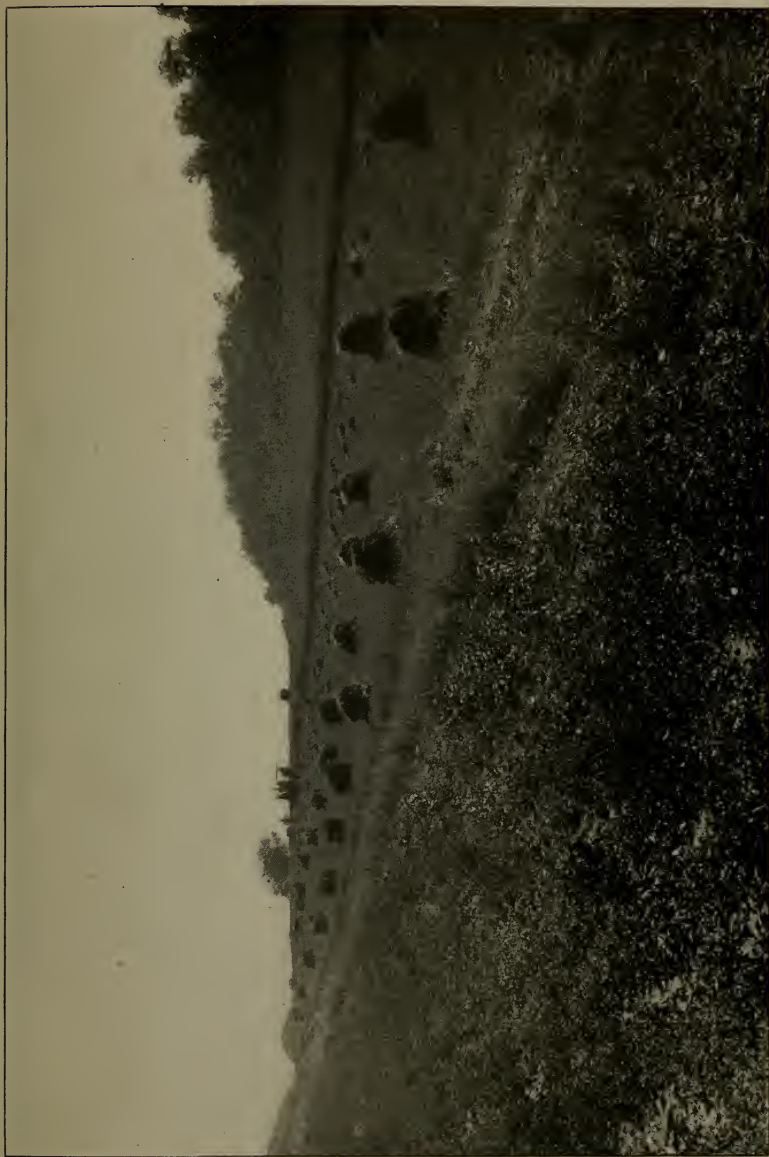
That year, on the sixth of August, I was invited down to Perry county, Pa., to talk at a farmers' picnic. The day before (August 5th) I went into my corn field, dug up some crimson clover plants and cowhorn turnip plants, and I took them with me to that farmers' meeting, and there, before about two thousand farmers, I laid on my rule crimson clover roots six inches long, and cowhorn turnip roots nine inches long. The point I want to make is this: inside of eight weeks, these roots were down in the subsoil after the potash and phosphoric acid,—the only way to get it.

This grew on until November 21, 1899. After the corn and fodder were put in the barn, we pulled the plow in the field, to turn under this growth of vegetable matter, and found we were turning under cowhorn turnips four feet long. When I make this assertion I see people in the audience putting their heads together, and I often wonder what they are saying to one another. Once a man whistled when I made this assertion; but, after I make this assertion, I modify it by saying, "that is, tops and all;" but the turnips proper were anywhere from eighteen inches to two feet long; and this I hang right on to, as we took a photograph of the plow turning them under,—the picture of which is in the book.

We plowed all the field except a strip about forty feet wide, left at the request of the Agricultural Department of Pennsylvania, and that we plowed in the spring; but with the eye we could never detect any difference. Another kind of winter might have made a difference.

I will venture to say that was the funniest looking field you ever saw when it was plowed; and, if you and some one had been driving along the road at my place, you would have turned to the man at your side and said: "Here is where that man Seeds, who talks on farming, lives. There is a sample of his plowing." Sometimes the plow would turn the turnips under; sometimes cut them off; and sometimes the plow would push one of those big turnips up out of the ground about eight or ten inches, and there it would stand; and the field looked as though we had gone in there and plowed down a lot of Indians, heels foremost, and their heads and feathers were sticking out of the ground.

That January we had a ground thaw, and I put on a pair of



Oat field on One-hundred Springs Farm in 1900. Isown broadcast without fertilizer of any kind, where turnips and clover had been plowed down



June 4, 1900, showing a red clover field on One-hundred Springs Farm. Clover twenty-seven inches tall produced in a very dry season, with decayed vegetable matter and humus.

STOCKMAN & FARMER, PITTSBURGH, PA.

rubber boots and waded out to see the field; and I could smell it long before I got to it.

The next spring, when we harrowed the field for oats, where one of those turnips that was pushed up out of the ground had frozen and decayed *there was a dark brown spot*; that is the milk in the cocoanut—decayed vegetable matter,—that which turns to humus, holds the moisture and helps unlock the plant food that is locked up and unavailable in the soil.

I am no chemist, nothing but an ordinary farmer, but my other habits are good. From the most careful figuring I could do, and from the best authorities I could find, I was plowing down twenty dollars' worth of nitrogen, potash and phosphoric acid to the acre,—and the cost to me was but eighty cents. Later, when I used the cowhorn turnip and dwarf Essex rape, I brought the cost down to fifty-five cents per acre.

That field was sown broadcast to oats, put in with the harrow without any commercial fertilizer or barnyard manure, for the first time on that old worn-out farm, in one of the driest seasons we ever had in central Pennsylvania; and, when the binder was cutting that oats, we had a photograph taken of it. A cut of the field is shown in the book.

The same season, on the fourth day of June, we took a photograph of a red clover field that was twenty-seven inches high—the result of moisture and plant food created and released with vegetable matter and humus. We show a cut of the field.

It has been shown that soil that is filled with decayed vegetable matter and humus, from one crop of crimson clover plowed down, will hold fifty tons more water to the acre than soil that is not. If you figure how much water you must have to raise a crop of corn, oats, potatoes, hay, etc., you will see the value of land that has the power to hold water.

We had a farmer in Pennsylvania who got his farm into such a condition that he said spring rains were a nuisance.

I have watched the soil until I make this assertion: that soil that is filled with decayed vegetable matter and humus is warmer in the winter-time, cooler in summer-time, wetter in dry weather, and drier in wet weather.

At Somerset, Pa., on December 4, 1907, when I made this assertion, men by the dozen immediately opposed my statement, by saying that such land could not be drier in wet weather.

Never was I driven into a closer corner. I thought and thought,

in order to find an illustration that would make my idea clear to them, and that would "back up" my assertion. At last I selected two of the leaders in the opposition, and put one of the following questions to each: I asked the first man to suppose a level ten-acre field, the one half of which had had vegetable matter and humus worked into it, and the other half of which had been left untreated. This being done, and the field plowed, I asked him to suppose, further, that rain should fall upon the whole field from Monday until Friday, and that on that day he should take some other man to an elevated place and ask him to say which half of the field was the drier. I then asked him to tell me what this other man's reply was likely to be. He hung his head a moment, and then confessed that in his opinion the man would select that half which had had the vegetable matter and humus worked into it. I then turned to the other leader in the audience, and spoke to him as follows: "If you take two three-gallon buckets, and put two gallons of soil filled with vegetable matter and humus into one of them, and two gallons of soil devoid of it into the other, then pour one gallon of water into each bucket, which lot of soil would appear to be the drier?" He paused, then said that the soil having vegetable matter and humus in it would be the drier. The reply of either could not have been otherwise, and, therefore, proved my assertion.

Every plant needs the balanced ration as well as the cow that gives milk or the hen that lays eggs. The dairyman will go into the stable, look the cows in the face, and say, "I will make you give milk," and puts a balanced ration in their trough for that purpose. A chicken man will figure out what it takes to make an egg, make the conditions all right, and give the old American hen the material to make an egg out of, and she's just got to lay or bust. These men have been going up and down the land, talking a balanced ration for a cow, hen, etc., but who ever heard any one talking a balanced ration for a plant, till "Bob" Seeds began it some years ago. No man can put a balanced ration in a commercial fertilizer sack, like that released by nature. If all farmers were not trying to balance that ration, they would all use the same brand of fertilizer; and thousands of dollars are wasted every year in the eastern United States by the farmers trying to balance that ration.

This last year, 1907, I have been lecturing in the state of Nebraska, and have learned that where they had used nitrogen, potash and phosphoric acid, separately, on wheat, the nitrogen showed by far the best. Hence, while I know that any vegetable matter will help

the soil, I believe that crimson clover, red clover, sweet clover, and alsike would be better for that soil than turnips, rape or rye; because it would gather the nitrogen from the air, and balance their soil ration quicker, that they have unbalanced by raising corn.

I believe the nitrogen the western farmer has was given him with nature's blanket, which I have so often talked about, and will treat more fully in another chapter; and the farmer who watches this blanket and helps nature will have nature help him in return.

I can take pure corn meal and kill little pigs with it. I can get a man's fattening hogs in such a condition with pure corn meal that he will have to kill them to save their lives.

I have taken nitrate of soda and gone into my oat field and kept every grain out of the oat head by unbalancing the ration. I have gone into my timothy field and made lots of hay with nitrate of soda, and the query to me is, "Why does a leguminous plant not care for nor use nitrate of soda, when it is a nitrogen-gathering plant?"

I was talking along the line of the blanket in Bucks county, Pennsylvania, a few winters ago, when a farmer got up and said he had covered one-half a field of grass with barnyard manure and the other half with pure clean straw. The straw-covered part was just as fertile when plowed and cropped as where he put the barnyard manure. I said, "Hold on, you are not telling all the story;" and when I got him into details he said they had threshed the wheat in the field and he hauled the straw from thresher in July and covered one-half of the grass field, and the next winter he covered the other half of the field with barnyard manure. I said "That will do." The truth was, he covered one-half of his grass field with straw in July, and it was a blanket holding the moisture when he had the heat. It benefited the mechanical conditions of the soil, disintegrated the soil, and unlocked some of that plant food that I talked about being locked up a while ago, and equaled the plant food in barnyard manure put on in winter-time when there was no heat.

After I was through talking in Crawford county, Pennsylvania, a few years ago, a man got up and said he manured a potato patch in a corner of the field he was going to put corn in. Something happened so that he had to put another field to corn, and the field with the manured potato patch was moved that year. The next spring that field went to corn, and after he had gotten his oats in and went to plow the field in question, for corn, it began to get dry, and he could scarcely get the field plowed; but, in plowing the field, when he came to the patch that was manured the year before, the

plow would go right through, because there was more moisture there than in the rest of the field.

People sometimes look at me when I say that the floods around Pittsburg and on the Ohio river are growing worse and more destructive every decade, because as the forests of western Pennsylvania and eastern Ohio are removed, and the farmers work the vegetable matter and humus out of the soil, the water-holding power is gone. Put a forest over western Pennsylvania and eastern Ohio, and the vegetable matter and humus back in the soil, and you cannot have a flood at Pittsburg, nor will you have low water.

When I was at Clarinda, Iowa, driving out through the country, I noticed, on one side of the road, that the corn was a much greener color than that on the other side. One field had been cropped in corn much oftener than the other, thus drawing on the store and taking out the nitrogen of the soil, until the corn was getting to be of a yellow color. In many places through Missouri, Nebraska, Iowa, and Illinois, I noticed that the high places, or ridges, through the fields, were beginning to produce yellow-looking corn, while, at the base of this hill or ridge, the corn was of a dark green color. The season of 1907 was one of the wettest in many years. I crossed and re-crossed the Missouri and Mississippi rivers many times, in attending Chautauquas, from June 15th to September 12th, and I believe that as much decayed vegetable matter, humus and plant food went down those two rivers as the farmers in those sections used in raising their crops that year. This was not so before the prairie was broken. The more the vegetable matter and humus is lost from the soil, the more the water runs off; and, the more the water runs off, the more and the faster it takes the vegetable matter and humus. In other words, the poorer the soil gets, the faster it goes; hence, the high places in the fields show yellow-looking corn first.

Listen to me. It is much easier to take care of it when you have it than to put it back after it is gone.

I was agreeably surprised to find the farmers of the middle United States as much interested in the soil as anywhere I had been.

Nature has her way of doing things, and they cannot be changed; and how can we expect to have nature help us when we are determined to be against her all the time?

When raising early potatoes for the early market when tops are green, we had to haul the tops off the patch. I hauled them on a poor knob in a grass field that was going to corn the next spring.

Those tops lying there the balance of the summer, as a blanket holding the moisture when we had the heat, released enough of that plant food that I talked about being locked up; so, when we were husking the corn in the fall, I stopped the men and called their attention to the length of the ears, the minute we struck the place where the tops had been put.

In Pennsylvania in the last eight years, men in my audiences have put all kinds of arguments and questions against me on this subject. At Beyers, Chester county, winter of 1904 and 1905, I stepped out on a platform to talk on the soil. Before I got started, a man asked me a question, and the audience kept firing questions at me for one hour and a quarter; then I sat down, without saying one word of my lecture.

At Selinsgrove, Snyder county, I had twenty-five or thirty men on my back at one time, and the chairman of the meeting offered any man a dollar who would corner me. I say this to show that I have fought out every inch of the ground on the platform and in the agricultural papers. They even went so far as to write to the largest agricultural institutions, and asked them to call me down for preaching a false doctrine.

They have called me, many times, a liar. Once, when I went to Birmingham station to take the train to Tyrone, I sat down on the station steps. While waiting for the train, a man from Pittsburg who had been to Birmingham summer resort over Sunday, with his family, sat down beside me. He looked across the Juniata river at my place, and said, "What public institution is that over there?" I said, "That is no public institution, it is private property." He said, "Well, when we see so many whitewashed fences, we think it is a public institution." After a short pause, he looked across the river at my hills and said, "That must be awful poor land over there." I replied, "I don't know about that, but I do know that man is shipping the soil from that land all the over country at \$1.50 per bushel." He hung his head a moment, then looked up and said to me, "Do you know, I am somewhat of a liar myself." There was nothing that I could have said that would have placed me back in that man's confidence; but, thank fortune, the day is here when the farmers all over the country are awakening up to the fact that their business is one that can be studied and improved, the same as many others. I speak from experience, when I say that the farmers' institutes of Pennsylvania have painted many a farmhouse, put many a lawn around the home, put sunshine and books into the home,

and made it a place that helped to keep the boys and girls on the farm, instead of being told by their father that farming was the meanest business on earth.

I am so pleased to see the people of the South and West so much interested in their calling, as well as many residents of the towns and cities. They are the people who forced me to put this lecture into book form.

I am a vegetable-matter crank. If I were to go somewhere to preach the gospel in some church, I would get to talking vegetable matter before they could take up a collection.

You can dig a well and throw the soil from two hundred feet under the surface out to the air and frost, heat and moisture, and nature will cover it with some kind of vegetable matter. So, my dear reader, it is not my particular way of making the soil fertile that I wish to impress upon you, but I want to point out that this is nature's way; and, while you may find a much better plan and more valuable plants than I have used, you cannot improve on nature's way.

Some old farmers in my township winked their off-eye and said I would sour the ground plowing down green stuff, and would get that old farm worse than ever. Some of those men have since been elected assessors in my township, and put twenty-five dollars additional valuation per acre on my farm.

The following is taken from Bulletin 61, June 1, 1903, of the Delaware Experiment Station, Newark, Delaware:

COWHORN TURNIP AS A SOIL IMPROVER

TURNIP may well be called a potash plant, from the large amount of potash it contains. The yield is something astounding, being 11,297 pounds of tops and 20,522 pounds of roots,—a total of 31,819 pounds, or $15\frac{3}{4}$ tons of vegetable matter per acre. As shown in Table 1, this material contained 109.5 pounds of nitrogen, 142.6 pounds of potash, and 26 pounds of phosphoric acid.*

Compared with crimson clover, the turnips contain 63 per cent more potash than does the clover, although they contain less nitrogen and phosphoric acid. The leaves are twice as rich in potash, pound for pound, as are the roots. The objection to turnips is that the plants do not survive the winter. The foliage is killed by hard frosts early in the winter, and soon decomposes. The roots decay rapidly, except the skeleton of tough fibrous matter. It is quite probable that part of the plant food of this crop escapes from the bare soil when no other crop is put in with the turnips. It is economy, as well as good management, to use some winter-surviving crop like clover or vetch with them. If it is desired to use part of the roots for stock food, this may be done without impoverishing the land, if the stable manure is applied to the part from which the turnips are taken.

Dwarf Essex rape (*Brassica Napus*, Linn). Seed sown at the rate of eleven and one-half pounds per acre gave a good stand. It had attained a height of from two to two and one-half feet by November 1st (see Plate II-A). The rape is a vigorous grower and will stand considerable frost without much injury. During December, the plants "go down" and soon decay, except the roots, many of which live over winter. After mid-winter, the rape does not protect the ground much; it disintegrates and disappears. The old roots start growth early in the spring, and, where enough of them survive the winter, will aid in taking up the surplus moisture from the soil early in the spring. They usually go to seed in April. About nine to ten pounds of seed are sufficient for an acre. Chemical analysis

*At the present prices of nitrogen, potash and phosphoric acid, the turnip and rape would be worth from twenty-five to thirty dollars per acre.



Illustrations used by permission of Delaware Experiment Station

A. Rape nearly two feet high, November 15, 1901. B. Turnips one foot high, November 15, 1901 (original)

of rape shows it to be richer in total amount of plant food than crimson clover. It has nearly as much nitrogen, almost twice as much potash, and more than two-thirds as much phosphoric acid as has the clover. Compared with cowhorn turnips, it has 18 per cent more nitrogen, 13 per cent more potash, and 80 per cent more phosphoric acid. (See Table I.) Its total yield per acre was 26,620 pounds of green tops, and 864 pounds of air-dry roots.

Mention was made of the amount of nitrogen, potash and phosphoric acid which the various crops contained, and it is desirable to bring the figures together, so that they can be readily compared. The table on the following page was made up from Tables I and II in Bulletin 60, by Professor Penny, and shows the date of seeding, date of taking samples for analysis, the yield of the tops and roots per acre, and the amount of nitrogen, potash, and phosphoric acid, contained in the various crops. The roots were taken to a depth of twelve inches, and were necessarily dried before being weighed; the tops were weighed green. In comparing the amount of fertilizing ingredients of the different crops, the reader must not forget to take into consideration the differences of the total yields.

	Cowhorn Turnips	Rape	Crimson Clover	Red Clover	Alfalfa	Hairy Vetch	Cowpeas	Soy Beans
Seed sown	July 22	July 22	July 22	July 22	July 22	July 22	July 22	July 22
Sample taken	Nov. 15	Nov. 16	Nov. 22	Nov. 22	Nov. 20	Nov. 19	Nov. 7	Nov. 11
Lbs. green tops ..	11,297	26,620	18,800	6,909	5,430	13,150	5,933	10,952
Lbs. air-dry roots ..	*20,522	864	413	1,212	1,980	600	394	756
Total yield	31,819	27,484	19,213	8,121	7,410	13,750	6,327	11,708
Lbs. nitrogen								
In tops	64.4	116.2	128.2	69.8	54.8	108.0	65.2	130.9
In roots	45.1	13.2	6.2	33.2	40.4	13.2	4.3	9.3
Total	109.5	129.4	134.4	103.0	95.2	121.2	69.5	140.2
Lbs. potash								
In tops	80.3	148.2	84.0	46.5	32.2	78.4	47.4	46.2
In roots	62.3	13.1	4.2	9.9	9.5	7.1	2.4	1.8
Total	142.6	161.3	88.2	56.4	41.7	85.5	49.8	48.0
Lbs. phos. acid ...								
In tops	14.3	41.8	59.2	18.9	13.1	22.5	16.6	37.8
In roots	11.7	5.1	2.0	10.1	8.5	4.7	2.3	2.4
Total	26.0	46.9	61.2	29.0	21.6	27.2	18.9	40.2

*The turnip roots were weighed in their natural state, just after being dug; this is, therefore, not dry-air weight.

BALANCING THE RATION (Author)

From Ohio Experiment Station

Measure and Treatment	Increase per acre			Net value of increase	
	Corn bus.	Wheat bus.	Hay lbs.	Per acre	Per ton manure
Yard Manure:					
Untreated	16.0	8.0	698	\$17.22	\$2.15
With gypsum, 40 lbs. to ton	21.5	11.3	1,007	22.12	2.76
With kainit, 40 lbs. to ton	22.7	11.1	1,246	22.13	2.76
With floats, 40 lbs. to ton	22.9	13.1	1,605	26.52	3.31
With acid phosphate, 40 lbs. to ton	27.2	14.7	1,768	29.22	3.65
Stall Manure:					
Untreated	22.2	9.9	1,280	23.70	2.96
With gypsum, 40 lbs. to ton	25.8	12.3	1,310	26.45	3.31
With kainit, 40 lbs. to ton	26.9	12.9	2,079	28.26	3.53
With floats, 40 lbs. to ton	28.1	15.2	2,541	34.56	4.32
With acid phosphate, 40 lbs. to ton	32.2	15.8	2,739	36.44	4.55

The untreated stall manure has been worth eighty cents per ton more than the untreated yard manure, while the ton of phosphated manure has produced more than twice the increase recovered from the ton of untreated yard manure.

ANOTHER VOICE SAYING "AMEN"

(Chicago Tribune, August 4, 1907)

PLANTS ENRICH THE SOIL

IT was not a power plant, but plant power, that made an island of the sea off Australia one of the most valuable grazing districts. It is King island.* Many years ago a Dutch ship was wrecked off the island coast and some of the sailors' mattresses were washed ashore. These were stuffed with what is known as Melilot grass, which, however, is really not a grass, but a yellow-flowered clover, known botanically as *Melilotus officinalis*. The plant thus washed ashore contained a fair amount of seed, and, in the course of years, these seeds took root and threw up tufts which gradually spread on the beach and inland. And now the result is that the fertilizing power of this little plant has transformed King island from a region of useless sand-dunes into one of the best grazing districts of the Australian commonwealth. This wonderful grass, sown on raw, white beach sand, in the course of five years has changed the character of the sand, until, at the end of that time, it has become a *dark brown color*, in some places almost black. Every year it is improving the value of the land. As is well known, the capacity of the clover and other leguminous plants to enrich the soil is due to the presence of bacteria, which enables the plants to take nitrogen directly from the atmosphere.

*There has been some controversy as to which plant made this island fertile, but it was a leguminous plant and one that will grow and do good work on poor land.



Top, or head, of Sweet Clover
(*Melilotus Alba*)

*Illustration from United States
Department of Agriculture,
Washington, D. C.*

SWEET CLOVER (*Melilotus alba*)

I HAVE been watching this plant for some time, and lately I have been growing some of it. I will not attempt to write on it from experience, but I believe it is the plant that is the salvation or redemption of much of the worn-out lands, for it will grow on the poorest land you can find. I have seen it grow through sparks and cinders along the railroad track, on the cinder dump at an old furnace, and on piles of pebbles along the Conemaugh river bank, the soil all having been washed off the pebbles by the great Johnstown flood.

It is a leguminous plant that will bring the nitrogen out of the air and will grow where you cannot get other legumes to grow.

I cannot see why this plant would not be a godsend to the abandoned fields of the northern and southern states. If they would sow such fields with this clover and let it lie, they would surely get fertile. Some say to me, "Why, nothing will eat it." If this be true, then it is a greater plant than ever. Then no one will take it off the poor land and rob the field, and keep nature from restoring the soil.

I am going to know more about this plant in the near future. Some say to me, "Be careful, it is a weed." I traveled from June to September, in 1907, and saw much sweet clover grow along the railroad and the roadside, but I never found or saw a stock of it in a farmer's field, or in his way, and never found a man who had seen it bother any one. It is the prettiest weed I ever saw, and there are some thin places on my farm that are going to get a sowing of it. I am going to try the white and yellow blossom the coming season.

Did any one ever see a leguminous plant that was hard to kill or destroy? I should like to meet such a person. When sweet clover is young, it looks somewhat like alfalfa, has a whitish blossom, grows tall and branches out as it grows up, and gets woody as it matures. I show a cut, or picture, of the plant. I received the half-tone from the United States Agricultural Department, Washington, D. C.

I should have a picture of sweet clover and plow turning it under. I went to Ohio last fall a year on the 16th of October, and did not get back till November 27th. When I left, I said to my oldest son, "Walter, I want you to plow down the sweet clover and take a photo of it." When I came back he said he had been so busy that he could not get it done. But, the truth of the matter was, he was sparking a girl all summer. If I did not get the photo, he got the girl.

IMPROVING THE SOIL FROM ORGANIC, OR ANIMAL MATTER STANDPOINT

MY grandfather came from Ireland years ago, married a man's daughter, with whom he got one hundred and ten acres of woodland. He cleared the land, erected buildings, and raised big crops because he could not help it. Some years after he got the farm, it did not produce crops as it did at first; and he began, as all other farmers in my part of Pennsylvania did, to sow Nova Scotia plaster. Everywhere they threw a handful of the plaster the land yielded a larger growth, and I used to sit on the top rail of the old worm fence, with my arm around my grandfather's neck, while he would pick out a certain spot in the clover field, or row of corn in the corn field, where the boys failed to put Nova Scotia plaster. Soon many plaster mills were built on the streams of Pennsylvania, and hundreds of boat- and car-loads of the plaster came up into the state. The day came when I carried the plaster bag on my shoulders and plastered the row of corn along the fence heavily, the next row a little lighter, and so on, until I would not put any on. This practice was continued, and the day came in Pennsylvania when you could not see where you put the plaster; and today the old plaster mills are known only on the pages of history.

The farmers kept on cropping the land until it was not yielding so well as it had been, and they wanted to make it more productive. Therefore, they began, down in eastern Pennsylvania, to put up lime kilns, and continued to do so until they were as thick as flies around a sugar barrel on the fourth of July. Then they began to burn lime and to haul it out, until the state was a great white sheet. Every place they threw a shovelful of lime it made the earth richer and more productive; and, in my section, old men and their boys used to lean up against the old worm fence, and look over into the field where they had put on lime, and wonder what they would do with all the crops they were raising. Today the father is dead, and the boys are leaning up against the same old fence, looking over it into the field, and wondering what in thunder is the matter with the land; while the lime kilns are covered with moss and ivy, and birds are building their nests in them. In many places you could not get your board in exchange for spreading lime for them, and all because they have neglected the vegetable matter necessary for the soil.

What have they done? They have used the lime which is as a key that unlocks the great store of plant food that is locked up in the soil, to make it available for plants. They have produced vegetation; have taken it away; and have not given back to the soil any thing in return. You could not farm a field twenty years in succession with the use of lime alone. It is not the fault of the lime, but the fault of the man who did not take care of and handle rightly that which the lime gave him.

The farmers kept on cropping the land, and, as it was not doing for them what it had done, they began down east again, and so came up through the state, using commercial fertilizers until, last year, the farmers in the state of Pennsylvania went down into their pockets and brought up eight million dollars and put them into commercial fertilizer. What for? To have some place to put their money? Not much! They did it to make the soil do what it had done for their grandfathers for nothing, and all because the decayed vegetable matter and humus had been worked out of the soil.

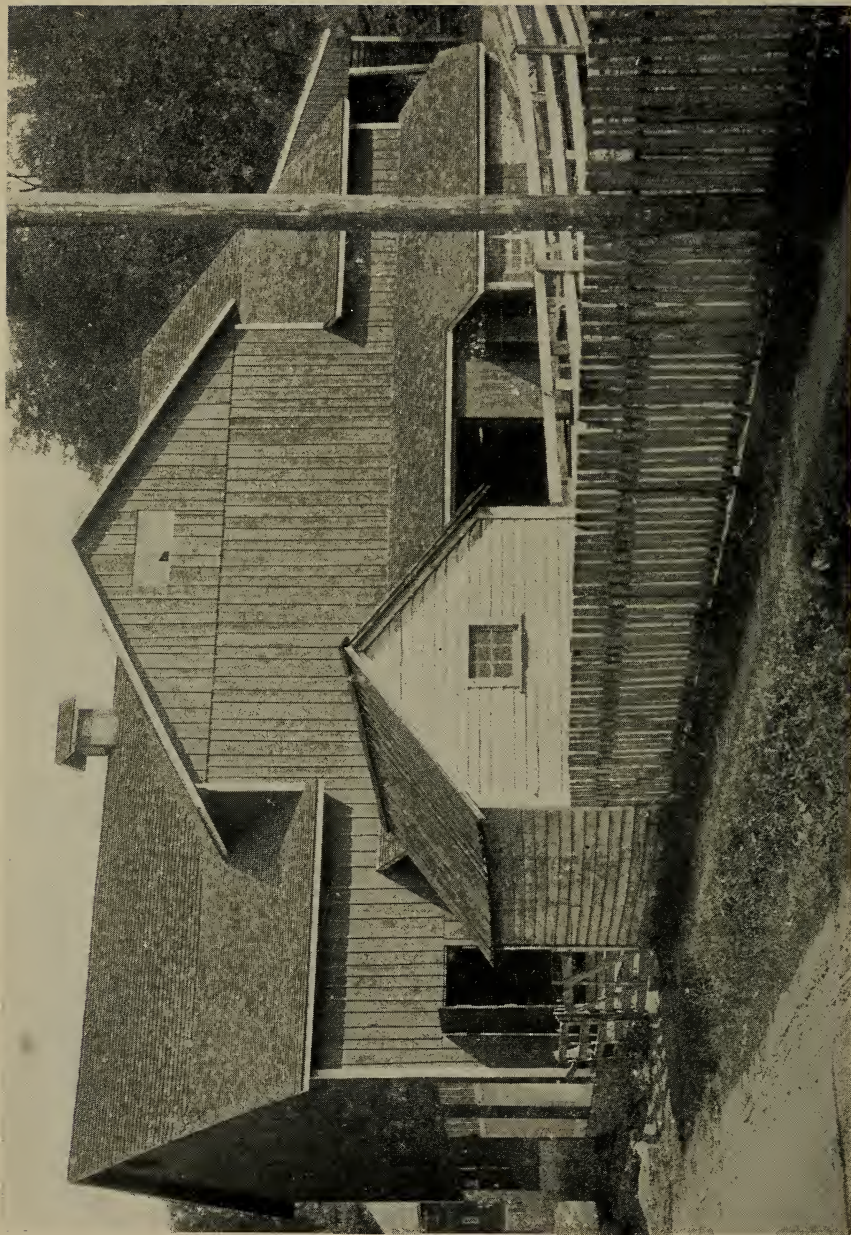
We do not look at things as they do in some of the old countries. Think of about eighty-three dollars worth of plant food running out of most of the barn-yards of this country in one year, and barn-yard manure losing sixty per cent of its food value in one hundred and four days, by lying out in the open barn-yard!

I watched this go on, and the colored water run across the public road into the Juniata river, until I could stand it no longer; so I covered the barn-yard and puddled the bottom with yellow clay of both barn-yard and stables, in order to hold this liquid manure.

I have cut the corn-stalks in my barn until I think it is a sin to feed whole corn-stalks. If I were given to profanity, I would go somewhere to a place where they were feeding whole corn-stalks and clean out their stables for them and do my swearing there. I think the Lord would forgive me there quicker than in any other place. Never feed whole corn-stalks except just before a protracted meeting.

THE WAY TO HANDLE BARN-YARD MANURE

It is much easier to do work in a book, or when talking before an audience than out on the farm. If I could have my own way and do it, I would keep the stable manure under cover,—keep it from heating; and then in the spring, when the grass in my mowing field was three or four inches high, I would haul the manure all out in one day, and spread it evenly over the grass field.



The fertilizer factory. R. S. Seeds' barn

That night I would lie in bed and have a thunder shower come up and leach the fertility, or plant food, out of the manure down among the roots of the grass-roots that were alive and active, ready to take up this plant food. I would feel so much better than if it were put on bare ground, or plowed down.

Think of my grandfather leaving the manure in the open barn-yard, to lose the sixty per cent of its food value, and then, when the spring work was done, hauling the remaining forty per cent out on the corn-stalk field (fallow field), pulling it off the wagon with that old, ugly, crooked-handled dung-hook that hung in the barn—that daylight robber that caused more mortgages to be put on farms than any other implement of its size in the world.

There the manure would lie in piles until they went in to plow the field. After opening the land between the rows of manure piles, they would spread the manure, while the horses were resting, by throwing it around in chunks the size of my head, and plowing it down to the bottom of the furrow. So the forty per cent was doing no good, and did not produce a blade of any thing until something was sown in the field and the roots got down to the manure.

There are some people doing this today. Stable manure is never better or more valuable than the day it is made; but, as we cannot always get on the fields, I covered my barn-yard.

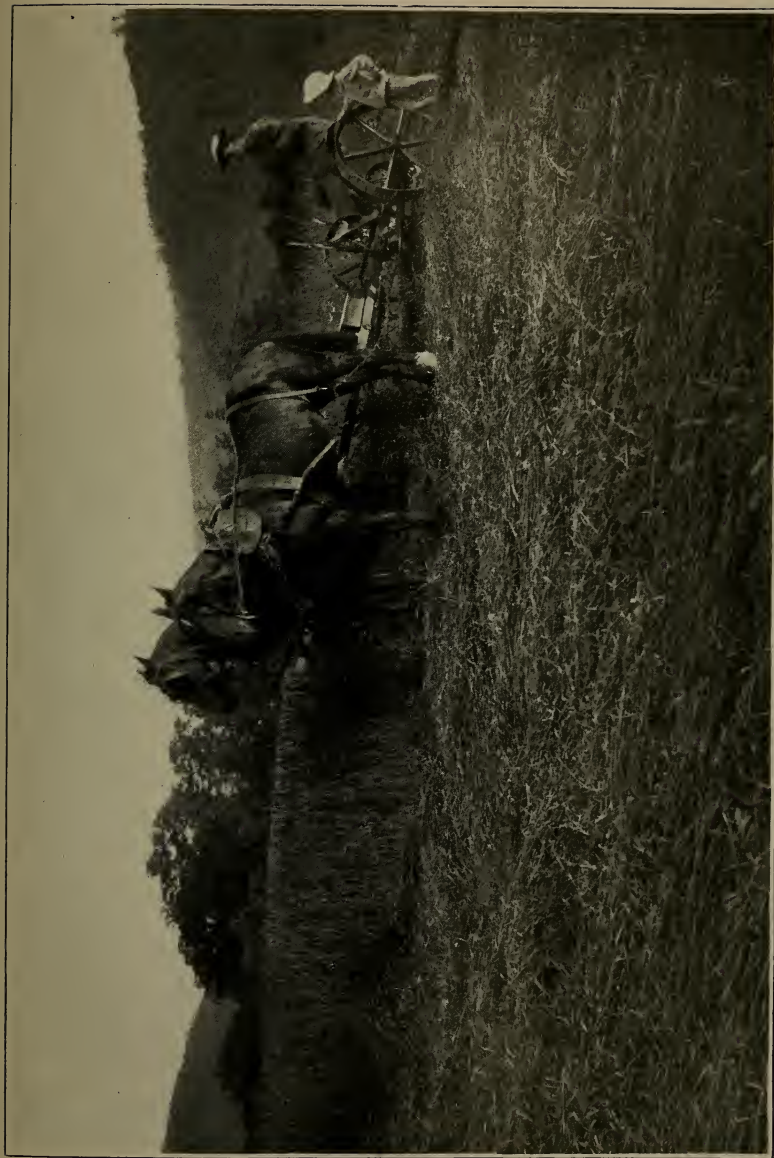
I want the stable manure on the grass because it is a nitrogenous food, and produces stalks, stems and leaves; and stalks, stems and leaves are hay and vegetable matter. When you plow down stable manure you wait a long time for it to put any thing back to the barn. When I put it on the grass in winter and early spring, I put hay in the barn, in June and July, that is produced by it. When the growing weather comes, it is not long until you can see the effects of the manure on the grass. One ton of manure on the grass is equal to two tons plowed down.

Then after the plant food is leached out of the manure down about the roots of the grass, you have the organic matter left on the surface as a blanket to hold the moisture where you have the heat. Nature, with these two to disintegrate the soil, benefits its mechanical condition, and releases and makes available the locked-up plant food that the plant cannot otherwise get. The man does not live who can get this locked-up plant food in any other way but nature's way; and, when he does get it, it is nearer a balanced ration for the plant than any living man can put in a commercial fertilizer sack. Plants need this balanced ration just as much as do the cow, pig or chicken.

You often hear a man say that he has a plot of land that is so rich that everything he sows on it lies down. You tell him to put on South Carolina rock (phosphoric acid). He will say, "What, put on more fertilizer, and everything lies down now." He does not seem to know that his land is not nearly so rich and fertile as that which raises from fifty to sixty bushels of wheat to the acre. His land is loaded with nitrogen, "lop-sided," unbalanced ration, and needs to be balanced up.

A few years ago (the winter before my boys went from home to make their fortunes,—a project in which it took them twelve months to make up their minds to come back and put their feet under my table again), they hauled the manure on the mowing field. That spring Mr. Trimble came to crop my farm, and, when he saw the strawy manure on the mowing field, he came to me and said that he wanted to sell his share of the hay, and that no one would buy hay off of that field. I did not have a manure spreader at that time, and I said, "Never mind, Mr. Trimble, we will fix that. As soon as we get a shower to moisten the manure, I want you to hitch in the drag-harrow and harrow it." He did so, and the strawy manure would collect under the harrow and roll out in chunks the size of a half-barrel. When he was through, he came to me and said, "Seeds, it is worse than ever; no one will buy hay off of that field." I said, "Never mind, I will fix that." I got my little boy and another boy and we went out and shook the strawy part of the manure evenly over the field. The spring rains came and beat the strawy part of the manure down to the surface; the grass grew up through it, and the more it shaded the blanket the more it held the moisture; and the more it held the moisture the more it made the grass grow. So it went on. I know that things grow bigger in books than on the farm, and I do not say that Mr. Trimble had to back the wagon into the field to get a start to haul the hay out; but I do say that he bragged about the hay he was taking off the field. He never hauled cleaner or nicer hay to market, and that, too, from a field that a few years before would raise nothing. The strawy blanket of which Mr. Trimble was so much afraid was all rotted, and the hay-rake teeth went through it, and he could not have raked it up if he had tried.

The next year the boys came back, and, when they pulled the six-foot mower into the field to cut the second crop, I went up to Tyrone and brought the photographer down and had him take a picture of the mower cutting the second crop—on the old worn-out farm!



July 16, 1904. This field was mowed in 1903 and 1904. This shows the mower cutting second crop. Field was manured in winter of 1902 and 1903, and, after the two big crops of hay were taken off, it was a better field for corn in 1905 than it was in 1903, just after the manure was put on.



Effect of potash on muck land. The Illinois Experiment Station furnishes the above photograph, which shows the effect of potash on muck land. On the left, lime and phosphorus were applied; on the right, lime and potash. Other trials confirmed the results obtained here, showing that potash is the element lacking in muck lands. (Author, balancing the ration.)

Now, listen. This field was manured on the grass or surface; two big crops were taken off that they boasted about, and after the two crops were taken off it was a better field for corn than it was thirty days after the stable manure was put on; all on account of the blanket which held the moisture in the field when we had the heat. When you do not have the heat, it is of no use; you must have the two together, and the farmer who can devise means and ways of holding the moisture in his soil, when he has the heat, is master of the situation. Plant food becomes plentiful; the mechanical condition of the soil is improved, and one can plow in dry weather when another man can not. Simply nature's way.

The picture of the mower cutting this crop of grass is shown in this book.

I should like to have some one tell me how he can manure a field, then take off two big crops, and, after that, show that it is better for corn than it was just after being manured, or before the crops were taken off,—except in my way.

Is that all? No, indeed. When the farmer holds the moisture in the soil, when he has the heat, the same as nature does, the little earthworms, or fishworms, the farmer's best friend, come up to the surface and work there; and when you see the little earth castings lying around, caused by these little creatures, you know that they are working for the farmer, disintegrating the soil, and releasing, unlocking, and making available some of that locked-up plant food that I have been speaking about. If you can not hold the moisture when you have the heat, the worms will not come to the surface to work for you.

Last week, February 4, 1908, in Montour county, Pa., a man in the meeting got up and said that when he began to manure his corn-field (for the next spring), in the months of August, September, October, November, and on through the winter and up to the time he began to plow the field in the spring, he had noticed that the part of the field manured first was more fertile and better than the part manured later. In other words, the longer the manure lay on the field, the better and richer it was. These little testimonials come up every now and then to back up my idea. If he had mowed the field and held it over to the next year, it would have been better still.

THE LAWN

THERE is nothing, to my mind, that finishes a home like a lawn. Many an old house, well kept, with a nice lawn around it, is the wayside magnet that seems to draw you from the public road and makes you feel as though you wanted to go in and stay awhile. It seems to be a place made especially by nature for the blooming of flowers, the singing of birds; a place where the sun shines differently from what it does elsewhere; and when the lawn is covered with morning dew, and is kissed by the morning sun, making it sparkle like millions of diamonds, you have a picture no artist can paint.

You may spend thousands of dollars to build a home; yet, it might look like a jail when finished, and make the cold chills run up your back, and you would not stay there over night for fear of seeing things.

The first step in making a lawn is to grade and prepare the surface to a good, fine seed bed, and it should be reasonably good soil; then you want good seed, not clover and timothy, but Kentucky blue grass, or regular lawn grass, and *as clean as you can get it*. When sown on this prepared surface, brush or rake in with some fine-toothed implement, and after it is up, and when the ground is dry, if you have a roller, use it.

After some people have a lawn, they think they are fixed for life, as far as a lawn is concerned; but the truth is that a lawn will wear out as well as a farmer's mowing field, and, when the grass begins to get thin, the weeds will begin to come in—nature's way. The weeds may grow at the beginning, because the seed was in the grass seed, or in the ground. Keep them from going to seed, and they must all disappear.

Every two years, we ought to sow clean blue grass or lawn grass seed over our lawn. This keeps up the grass supply.

You cannot have a lawn with too much shade. I prefer to mow often and leave the clippings on the lawn. It is the blanket, and vegetable matter, that will do the lawn good. Every few years I cover the lawn with barn-yard manure, in the fall. Let it lie there all winter, rake it off in the spring, and that which we rake off we put on the garden. This is a little trouble, but I want to say that I made



"Bob" Seeds' back yard taken from kitchen door.

more money creating my lawn than I ever did taking a fat ox from the stall, or a bushel of potatoes from the cellar.

A man will stand in the public road in front of my place, and give more for my property on account of my lawn; but money is not the only thing in the world. The lawn makes the boys and girls want to stay on the farm. It is on the lawn that we spend our spare moments on Sundays, entertaining our friends, in the summer; and there, beneath the shade of the old apple tree, the smoke curls more beautifully from my chimney than from any other I ever saw.

The picture of "Bob" Seeds' back yard was on the front page of *The National Stockman and Farmer* some years ago. The camera was placed in the kitchen door when it was taken.

I do not believe that the back of the barn or the back of the house is the place for rubbish piles. My back yard, or background of the lawn, consists of fifty grape-vines, and is one of the most profitable spots on my farm. It is astonishing how your friends drop in to see you when the grapes are ripe! We eat all we can, and make grape-butter and grape-juice, generally putting up from twenty to forty quarts of the latter. As I am often asked for the recipe, I will publish it in this book.

GRAPE-JUICE

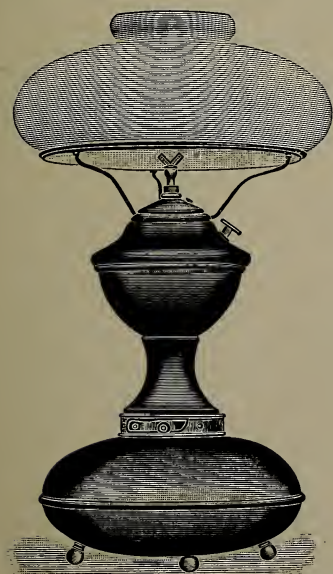
Select choice, sound Concord grapes. If you buy them, use none that are broken or moldy. Pick them from the stems and wash. Place in a colander for the dirty water to drain off. Place in a white, enameled preserving kettle. To each ten pounds, or six quarts, of the

Young Folks' Library of Choice Literature

For children, costing seven cents each, ought to be in every home where there are small children, especially the booklets treating of history and nature study.

Last week, January, 25, 1908, while I was at home, my little boy, Carl, eight years old, selected ten books of his own choice, and I was delighted to furnish the seventy cents for the post-office order to put in the little letter he wrote ordering the books of his own selection, in his own name. They are better books than I could select and order for him. The books can be had from the EDUCATIONAL PUBLISHING COMPANY, 18 East 17th street, New York City.

stemmed grapes, add one quart of cold water. Place over the fire and boil hard for ten minutes, or until the pulp is thoroughly cooked and broken. While the grapes are cooking, frequently stir with a wooden spoon. Remove from the fire and express the juice through a cheese-cloth bag. Replace over the fire. Add a very scant half-pint of granulated sugar to each quart of juice. Remove any scum that arises. When the sugar is dissolved, and the liquid has reached the boiling point, strain through a cheese-cloth or jelly bag. Replace over the fire, to keep it very hot while bottling. Bottle, cork and seal. Use bottles that have been thoroughly cleansed with water as hot as can be safely used; they should be filled while warm. In using fruit jars instead of bottles, a large wooden spoon should be used; do not use an iron spoon. Do not allow grape-juice to remain in a tin vessel one minute. If the hot juice is strained into a crock, the crock should be previously thoroughly warmed, or moderately heated to prevent breaking. Keep in a cool place. When using, if too strong, dilute with water.



People living in rural districts or small towns can have the pleasure of the city light by using the portable acetylene lamp, manufactured by the ACETYLENE LAMP COMPANY, 50 *University Place, New York City.*

Circular Letter Printed a Few Years Ago to Answer Questions

HUNDRED SPRINGS FARM

R. S. SEEDS, Proprietor

Birmingham, Pa. —————

My dear sir:—I cannot find time to answer all the letters which come to me; hence this circular letter, which, I trust, will answer all your questions.

You can get inoculating material from the Agricultural Department, Washington, D. C., for nothing, I understand; but, if you want inoculated soil from me, I will furnish the sacks, gather the soil from around the alfalfa roots, and ship it for \$1.50 per bushel; cash with order. If ordered, should like to see it used alongside of Washington inoculation. One bushel ought to inoculate one acre. A strip should be left without soil sown, to check up results.

In seeding alfalfa, I plow in the fall, or early in spring, ground that is not naturally wet, good soil, and harrow occasionally until June, to kill weeds; then on good seed-bed, sow twenty pounds of good seed to the acre, and inoculate. Cover with weeder or brush, and roll when up and ground is dry. Clip with mower when plants are high enough. As a rule, you cannot expect much from alfalfa in Pennsylvania the first year; although time of sowing, the kind of soil and season, may change this assertion.

For vegetable matter and humus, I used to sow one peck of crimson clover and one and one-half pounds of cowhorn turnip seed mixed to the acre, in front of cultivator, last time working corn, plow down next May or June, before the vitality left the stock to mature the seed in the head, and put to wheat that fall. Since wanting corn-stalks for oats, I had been using four pounds of dwarf Essex rape and one and one-half pounds of cowhorn turnip seeds mixed to acre, and plowed down in fall or spring for oats. Some other plants may be better than the ones I am using.

In regard to other plants, I have not been a howling success

For bedroom or hall-light, where you do not want to read, the glow light, manufactured by the GLOW LIGHT COMPANY, 73 *Pearl street, Boston, Mass.*, is a soft light, not using much oil, and no chimneys to clean.



Cutting alfalfa on One-hundred Springs Farm, on the banks of the Blue Juniata, June 20, 1902, in a very dry season.
Alfalfa eleven months old, with roots six feet long and tops three feet high

raising cowpeas, beans or vetches. I believe I did not have the proper bacteria.

I have been buying my timothy, clover, alfalfa, rape, vetches, etc., from Henry Nungesser, 65 Pearl street, New York City. Cow-horn turnip seed you can get from any first-class seedsman. Can get catalogues from advertisements in columns of *The National Stockman and Farmer*, Pittsburg, Pa.

In writing, always make name, post-office, and railroad station plain.

I am away from home much of my time, and request this letter to be mailed to all inquirers along these lines. I am,

Yours very truly, R. S. SEEDS.

QUESTIONS ASKED ME

Q. Would you spread stable manure in winter?

A. Yes, on hard, frozen ground, or snow, but not on ice. I have seen men pile it up in the field and one on of the coldest days watched it heat, melt the snow, and release the nitrogen.

Q. Do you use lime?

A. Yes, and put it on with the drill that puts on 1,000 pounds of air-slaked sifted lime to acre, as well as 150 pounds of fertilizer, and when it gives me vegetable matter I see that it gets a chance. In most cases, no man can farm a field twenty years in succession with the use of lime. (My drill was made and guaranteed by Missouri Drill, Genesee Valley Manufacturing Company, Mt. Morris, N. Y.)

Q. What did you use to get the start?

A. Commercial fertilizer. It is a godsend to the man who has to use it; but no farmer ought to be in a position where he is compelled to use it.

Q. For what purpose do you sell your soil?

A. For the alfalfa bacteria in it, or for inoculating other soils, as the chemist and scientific man has decided.

Q. How do you mix the whitewash you use?

A. When I am in a hurry, I slake the lime with hot water, keeping it covered from the air during the slaking, and put on water until it settles down to a paste; mix with hot water when applying. When I have time, I use the government recipe.

CEMENT WASH

(United States Government Recipe)

The wash used by the United States Government for the lighthouses and beacons, chosen for permanence under the most extreme exposure to the weather. Fresh hydraulic cement of any good standard kind, three parts, and clean, fine sand, one part, are mixed well with cold water and immediately applied. This gives a light brownish white, that is not so glaring as the common lime, and has been found to resist moisture better than any other wash. It adheres to brick or stone or wooden walls or fences very firmly. In its application, the walls are first wet with water, by which the adhesion of the wash is made stronger than if applied to a dry surface.

LIME WASH

A good wash is made in this way: Half a bushel of good, fresh lime is slaked with boiling water, and kept covered from the air during the slaking, to prevent weakening of the lime by the carbonic acid of the air. It is strained through a fine sieve or cloth, and seven pounds of salt are added. Three pounds of rice flour boiled to a thin paste, half a pound of Spanish white, and one pound of broken glue steeped in cold water and then dissolved in hot water are then added. When well mixed by stirring, five gallons of hot water are mixed in and the whole again stirred. This is kept a few days closely covered, when it is ready for use. It is applied hot, being kept in a kettle over a fire. This may be colored a light brown by burnt umber or a cream-yellow by yellow ochre. A light gray is made by adding a small quantity of lamp-black, previously mixed with water and thoroughly stirred. One pint of this wash covers a square yard.

ANOTHER WASH FOR FENCES AND BARNES

(This wash will last for five years.)

A half-bushel of fresh lime is slaked and strained, and three pounds of hydraulic cement are added, with water sufficient to reduce it to a proper liquid condition. Ten pounds of burnt umber and one pound of Venetian red are well mixed, dry; four ounces of lamp-black, killed with sufficient vinegar, are then mixed with water and

added to the other materials. The whole is diluted to make a barrel of thirty gallons. It must stand a few days and be frequently stirred before using.

A wash for inside work that will not rub off is made of one pailful of common lime-wash, to which is added a thin paste made of a half pint of flour and boiling water.

Whitewash, even though faded, adds much to a property, and increases it in value. I find boys who are anxious for the job at fifty cents per day and board themselves, and it is amazing how they change the looks of things in ten days. As scarce as help is, a person must be careful what he advises men to do on the farm.

My mother always taught me that where there was a will there was a way, and it seems to me I am always facing things I can not do,—but I get them done somehow. My oldest son, who has been managing my farm the last two years, is going to a 700-acre lumber job with his brother, and dad is going to have his farm on his hands again. Imagine dad farming and talking at public gatherings eight months in the year! But I take courage from the motto that hangs in my home:

**“I am an old man and
have had many troubles, but most of them
never happened”**

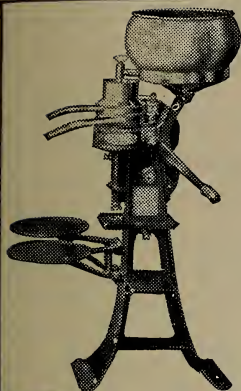
I have tried to write this book as I talked the soil before the people last summer at many of the Chautauquas. I could have sold hundreds of books on the soil, but did not have them; hence the putting of my soil talk in book form.

People blame me for being the biggest story-teller on the American platform; perhaps it is because I am Irish. I have kept the stories and frills out of the book, for fear some one may read it who does not know “Bob Seeds.”

L. O. C.



From National Stockman and Farmer, of Pittsburg, Pa., Christmas Number, 1904
The point of the joke. Bob Seeds adorns his remarks to Professor McDowell and Professor Butz with a story.



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Marion, Pa., February 25, 1908.

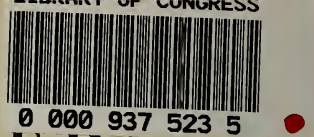
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